UNIVERSITY OF TORONTO
DIVISION OF EXTENSION

Session 1965–66

Course in

STATISTICAL METHODS IN QUALITY CONTROL

in co-operation with the
TORONTO SECTION
AMERICAN SOCIETY FOR QUALITY CONTROL

STATISTICAL METHODS
FOR
QUALITY CONTROL

Tuesdays **20 Lectures**

There are two major requirements for the control of quality in a manufacturing or processing operation; first, scientific control of the operations or processes and second, control of the methods of collecting, presenting, and analysing the information about the processes involved. This is accomplished by applying methods or techniques based on known and tried statistical theories. These techniques are reasonably universal in application and can be used by the engineer or chemist with equal facility. This course is concerned mainly in demonstrating what these techniques are and how they can be applied, where they are suitable and how they operate, and to this end, sampling tables, charts, and other devices are demonstrated as these techniques must fit in with the pace of industry. The purpose of the course is to show that quality control involves far more than a scientific approach to inspection, and although only applicable to mass production situations, it can be used as a management tool of great value.

Minimum Requirements

Previous training in quality control or applied statistics is desirable in addition to a thorough understanding of high school algebra.

Course Chairman

Mr. C. S. Argyle, P. Eng.,
Long Manufacturing Co. Ltd.
Oakville, Ont.

TIME: Tuesday 7.30 p.m.
Fall Term: October 12–December 14
Winter Term: January 4–March 8

PLACE: Room 348, Galbraith Building

FEE: $40.00

Registration

By mail or in person at Room 201, 84 Queen's Park, 9 a.m. to 5 p.m. daily, except Saturdays. Information may be obtained by telephoning 928–2393, 928–2394, 928–2395, or 928–2396.

PROGRAMME

1. **Introduction to Quality Control**
   Historical background, work of Shewhart, Dodge and Romig, chance and assignable causes, role of statistics, definition of quality, specifications for quality, presentation of data, the idea of sampling and probability, the normal distribution.

2. **Sampling by Variables**
   Calculation of average and standard deviation from grouped data, probability paper, normal and log normal data.

3 and 4. **Control Charts—Variables**
   Average and range charts, control limits, chart factors, trend charts, charts with modified limits, sensitivity of averages, assignable causes, definitions.

5 and 6. **Control Charts—Attributes**
   Various types of charts, control limits, limits with variable sample sizes, charts with two-way limits, table and charts for calculation of limits, definitions.

7. **Attribute Sampling Plans as Decision Processes**
   Introduction to sampling plans, operating characteristics of sampling plans, consumers and producers risks, definitions and terminology, acceptance and rejection numbers.

8. **Sampling by Attributes—Sampling Plans**
   Attribute plans, single, double, multiple and sequential plans; AQL, AOQL, ATI, etc.

9 and 10. **Administration of Attribute Sampling Plans**
   Available tables, MIL-STD 105D and CGSB 105-GP-1, advantages, levels of inspection; normal tightened and reduced sampling, practical applications.

11. **Single Level Continuous Sampling Plans**
   C.S.P. 1, 2, and 3; H-107 sampling tables.

12. **Multilevel Continuous Sampling Plans**
   H-106 Sampling tables.

13. **Rapid Statistical Methods**
   Use of inefficient statistics.

14 and 15. **Administration of Sampling Plans for Variables**
   Advantages, plans for single and double limits with known and unknown standard deviation, MIL-STD 414, computations, normal tightened and reduced sampling.

16 and 17. Tests of Significance

Introduction, "t" test, "F" test, judgements from small samples.

18 to 20. Introduction to Analysis of Variance

Single factor and two factor situations with and without replication, analysis of components of variance.

21. Optional Examination

Texts for the course:

A.S.T.M. Manual on Quality Control of Materials.
An Introduction to Statistical Methods by H. J. Halstead (Macmillan)

These texts will be made available through the University Book Store. Standards of inspection by variables and attributes will be supplied to the students.

Recommended additional reading:—

1. *Statistical Quality Control* by E. L. Grant (McGraw-Hill)
2. *Quality Control Handbook* by Juran (McGraw-Hill)
3. *Statistical Methods for Chemists* by Youden (Wiley)
4. *Engineering Statistics* by Guttman and Wilks (Wiley)
5. *Statistical Methods for Chemical Experimentation.* W. L. Gove (Wiley)

LECTURERS: **Mr. R. V. Ward, B.Sc.**

Senior Member A.S.Q.C.,
Production Superintendent,
Canadian Industries Limited.

Mr. S. M. Prout, P.Eng.,
Fellow A.S.Q.C.,
Design Engineer,
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